

# GOOGLE MOTION CHARTS WITH R

Markus Gesmann, Eric Wambach

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# Disclaimer

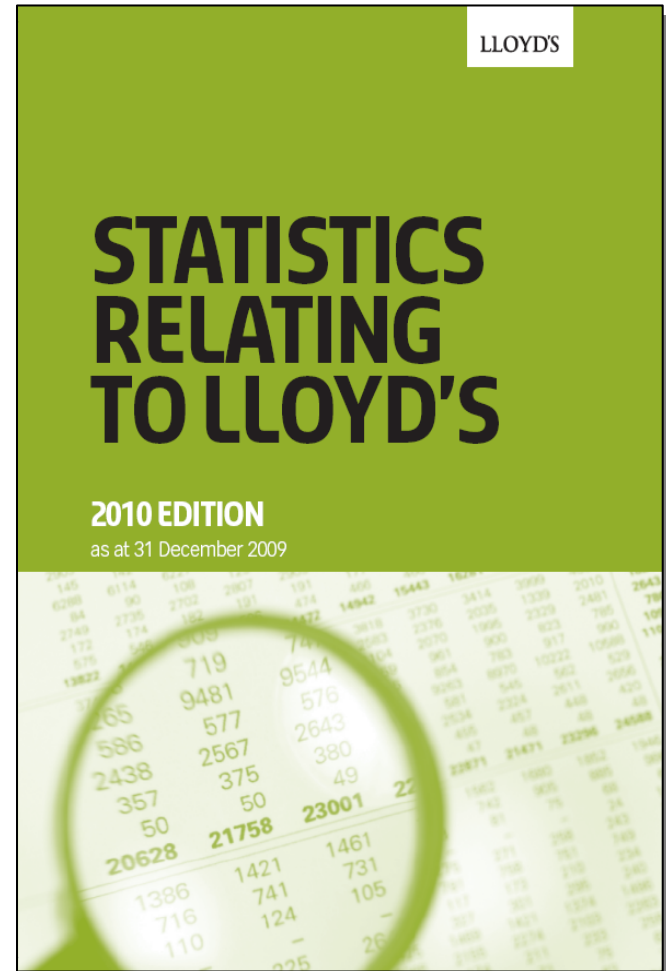
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# Agenda

- Motivation
- Google Motion Charts
- Google Motion Chart R package
  - `googleVis`
- Case study

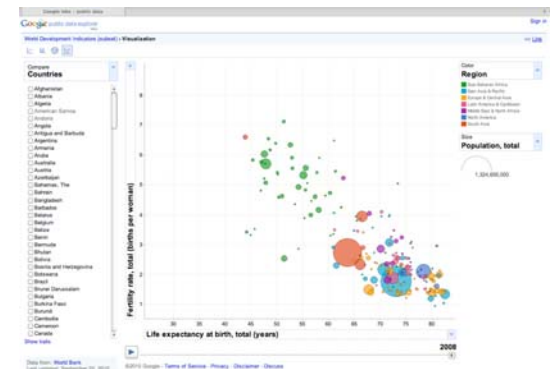
# Motivation

- Lloyd's started to published the 'Statistics relating to Lloyd's' in 2010
  - Summary of market statistics
  - P&L and balance sheet information by syndicate
  - Underlying data available
  - Online: [www.lloyds.com/stats](http://www.lloyds.com/stats)
- **How can we bring the data to life?**

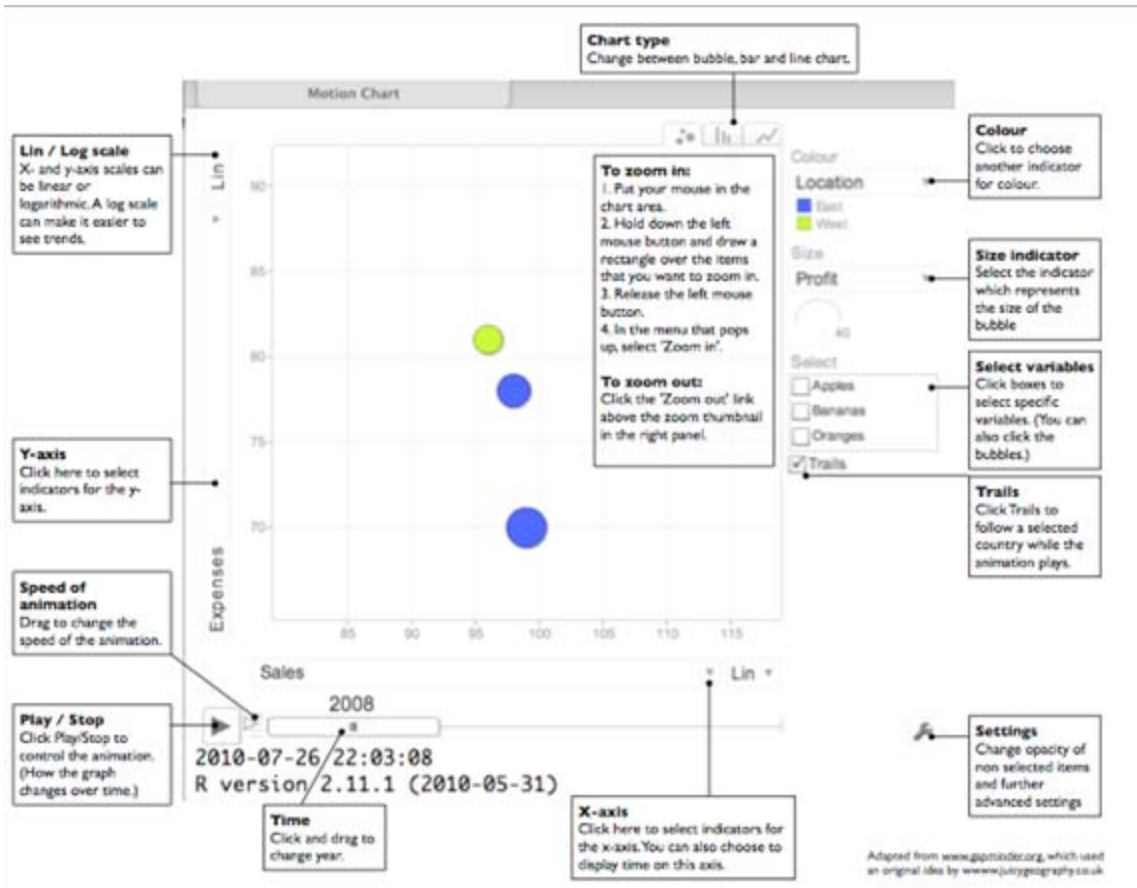


# Motion charts

- Popularized by Hans Rosling (Gapminder)
  - TED talk: [Hans Rosling shows the best stats you've ever seen](#)
  - [Google Open Data Explorer](#)
    - Access to public data
- Talk on Motion Charts by Sebastián Pérez Saaibi at Remetrics 2010 and BaselR July 2010
  - [Visualization of multivariate data over time](#)



# Google Motion Chart GUI

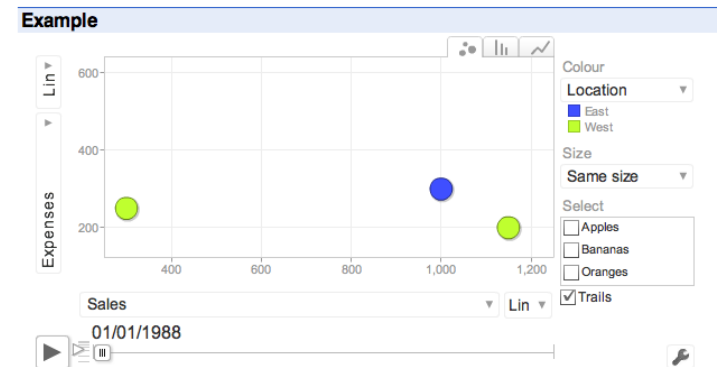


- A dynamic chart to explore several indicators over time.
- The chart is rendered within the browser using Flash.

# Google Motion Chart Api - Example

```
<html>
<head>
  <script type="text/javascript" src="http://www.google.com/jsapi"></script>
  <script type="text/javascript">
    google.load('visualization', '1', {'packages':['motionchart']});
    google.setOnLoadCallback(drawChart);
    function drawChart() {
      var data = new google.visualization.DataTable();
      data.addColumn('string', 'Fruit');
      data.addColumn('date', 'Date');
      data.addColumn('number', 'Sales');
      data.addColumn('number', 'Expenses');
      data.addColumn('string', 'Location');
      data.addRows([
        ['Apples',new Date (1988,0,1),1000,300,'East'],
        ['Oranges',new Date (1988,0,1),1150,200,'West'],
        ['Bananas',new Date (1988,0,1),300,250,'West'],
        ['Apples',new Date (1989,6,1),1200,400,'East'],
        ['Oranges',new Date (1989,6,1),750,150,'West'],
        ['Bananas',new Date (1989,6,1),788,617,'West']
      ]);
      var chart = new
google.visualization.MotionChart(document.getElementById('chart_div'));
      chart.draw(data, {width: 600, height:300});
    }
  </script>
</head>

<body>
  <div id="chart_div" style="width: 600px; height: 300px;"></div>
</body>
</html>
```



Source: <http://code.google.com/apis/visualization/documentation/gallery/motionchart.html>

# Google Motion Charts with R

- Project web site: <http://code.google.com/p/google-motion-charts-with-r/>
- Current authors:
  - Markus Gesmann
  - Diego de Castillo
- Contributors are welcome!
- Not on CRAN yet.

The screenshot shows the project page for 'google-motion-charts-with-r' on Code.google.com. The page title is 'Visualising R data.frames with the Google Motion Chart API'. It includes navigation links for Project Home, Downloads, Wiki, Issues, and Source. A menu on the left lists Overview, Installation, Presentations, Links, and News. The Overview section describes the package as an R interface to the Google Visualisation API, which generates dynamic flash-based bubble charts. It provides an example of a motion chart based on a Google Spreadsheet and shows R code for generating a motion chart locally. The code is: 

```
require(GoogleMotionChart)
Fruits ## Sample Data
MotionChartPage(Fruits, idvar="Fruit", timevar="Year", file="myFruitAnalysis.rsp")
```

 Below the code, it states that the output file contains all the data and a reference to the Google Visualisation API. The actual Flash chart is rendered within the browser. The rendered chart is a bubble chart with 'Year' on the x-axis (2008, 2009, 2010) and 'Fruit' on the y-axis (Apple, Orange, Banana). Three bubbles are shown: a green bubble for Apple in 2008, a blue bubble for Orange in 2009, and a purple bubble for Banana in 2010. The chart is surrounded by various control panels for data, settings, and navigation.



# Google Motion Chart R package

- Idea: Create wrapper functions which take a data.frame and produce html output following the Motion Chart API
- Display html output via web server
  - Use R.rsp package by Henrik Bengtsson
    - R Server Pages and Light-weight HTTP daemon (server).

# Current functions

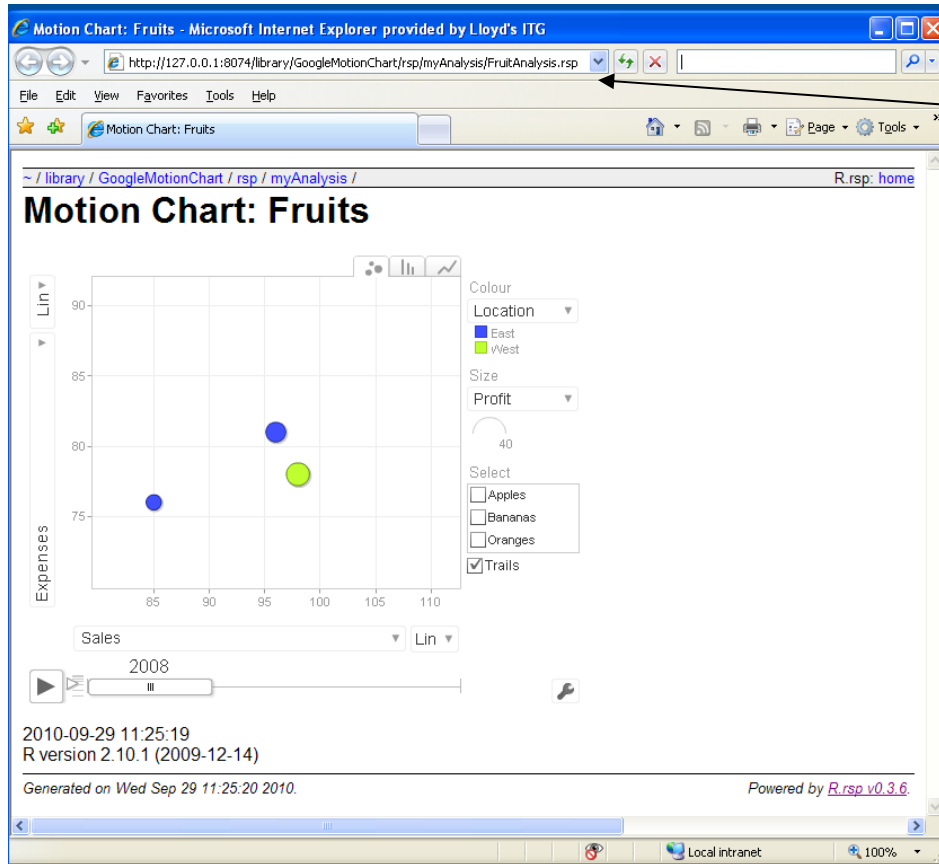
- Current package version 0.1.2 provides two functions
- **MotionChart**
  - Produces core html output
- **MotionChartPage**
  - Produces complete html page
- Input data requires data frame with an 'idvar' and 'timevar'
- Combination of 'idvar' and 'timevar' gives a unique row

# Example data set

> Fruits

	Fruit	Year	Location	Sales	Expenses	Profit	Date
1	Apples	2008	West	98	78	20	2008-12-31
2	Apples	2009	West	111	79	32	2009-12-31
3	Apples	2010	West	89	76	13	2010-12-31
4	Oranges	2008	East	96	81	15	2008-12-31
5	Bananas	2008	East	85	76	9	2008-12-31
6	Oranges	2009	East	93	80	13	2009-12-31
7	Bananas	2009	East	94	78	16	2009-12-31
8	Oranges	2010	East	98	91	7	2010-12-31
9	Bananas	2010	East	81	71	10	2010-12-31

# Motion Chart Example



By default files are written into GoogleMotionChart library folder to be accessible by R.rsp

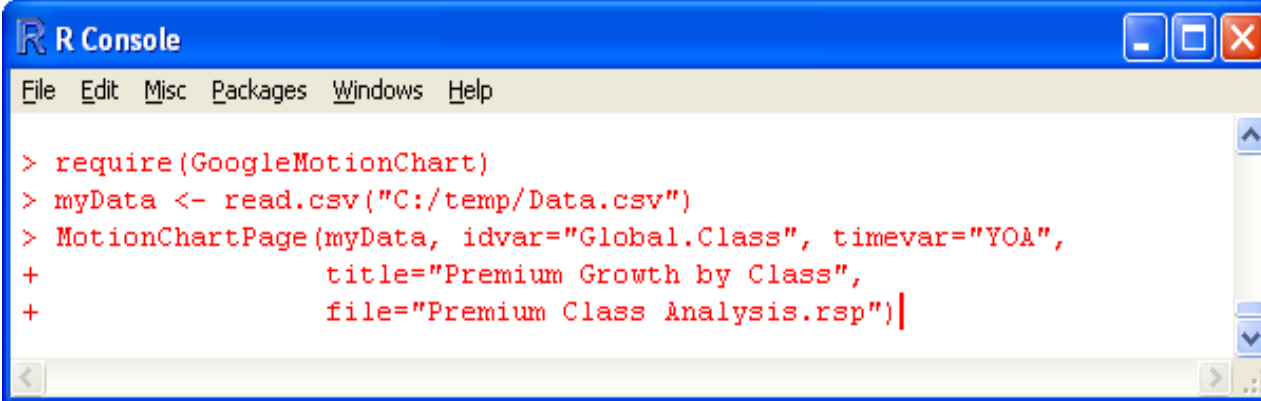
```
library(GoogleMotionChart)  
MotionChartPage(Fruits, idvar="Fruit", timevar="Year", file="FruitAnalysis.rsp")
```

# Next steps

- Develop package further. New name: **googleVis**
  - With a more generic framework
    - `gvisMotionChart`, `print.gvis`, `plot.givs`
  - Use of RJSONIO by Duncan Temple Lang from Omegahat
- Include further visualization APIs, such as
  - Table: `gvisTable`
  - Geo Map: `gvisGeoMap`
  - Tree Map: `gvisTreeMap`
- Publish on CRAN

# Case Studies

- Typical Application of Motion Charts in Business Environment:
  - Large Amounts of Data can be analysed visually
  - Various Measures can be compared simultaneously
  - Historic Development is visible
  - Outliers and exceptional performers can be identified easily
- Typical Code Snippet to create charts:



```
R Console
File Edit Misc Packages Windows Help
> require(GoogleMotionChart)
> myData <- read.csv("C:/temp/Data.csv")
> MotionChartPage(myData, idvar="Global.Class", timevar="YOA",
+                 title="Premium Growth by Class",
+                 file="Premium Class Analysis.rsp")
```

# Case Study – Capacity by Class

LLOYD'S

THE WORLD'S LEADING INSURANCE MARKET

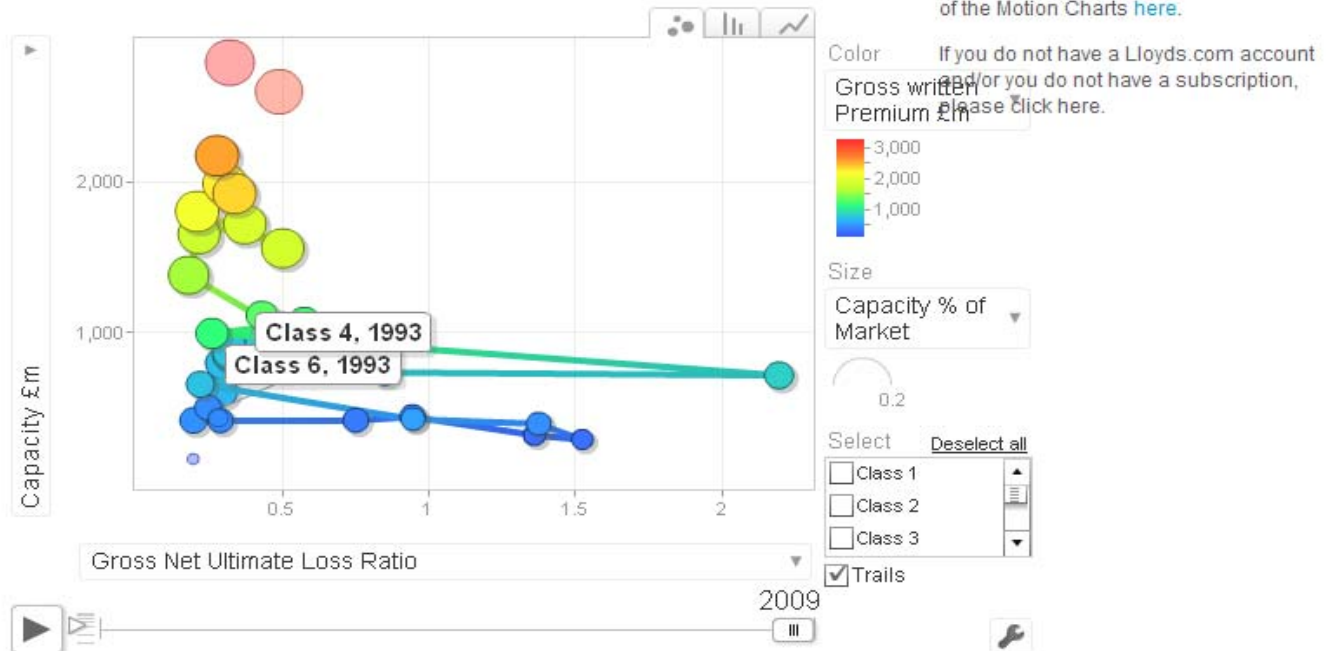
[LLOYD'S](#)
[THE MARKET](#)
[NEWS AND INSIGHT](#)
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## CAPACITY SPLIT BY CLASS OF BUSINESS

The Motion chart below shows the overall market Capacity by year of account for Lloyd's high level classes of Business from 1993-2009 weighted as a percentage of the overall capacity in the market.

### WANT TO ACCESS THE FULL VERSION?

If you have a Lloyds.com account and a valid subscription to Statistics Relating to Lloyd's, you can view the full versions of the Motion Charts [here](#).

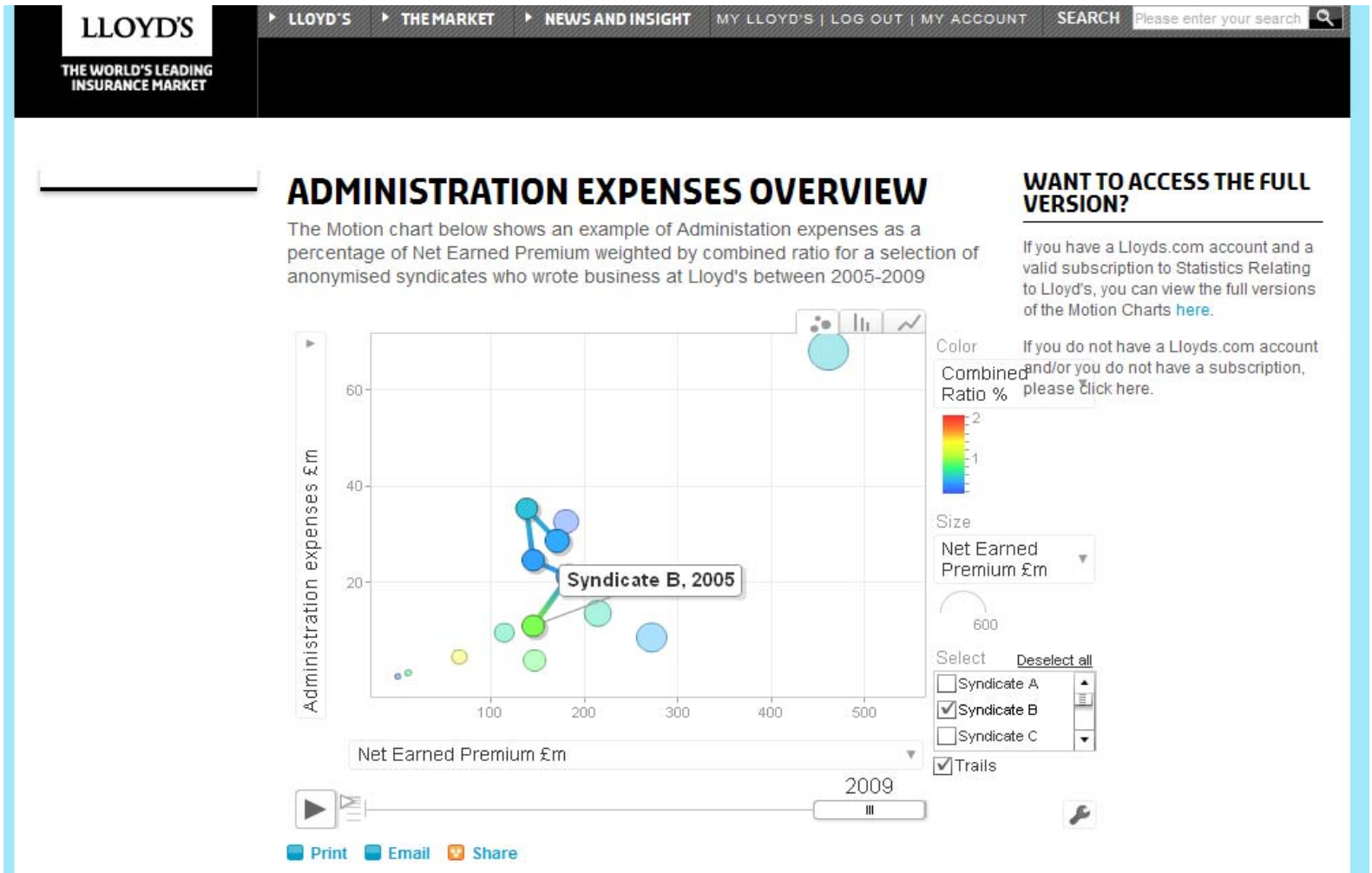


All figures are quoted in £GBP as at the relevant year end. No adjustment has been made for indexation.

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Dummy data for illustration purpose only.

# Case Study – Expense Overview



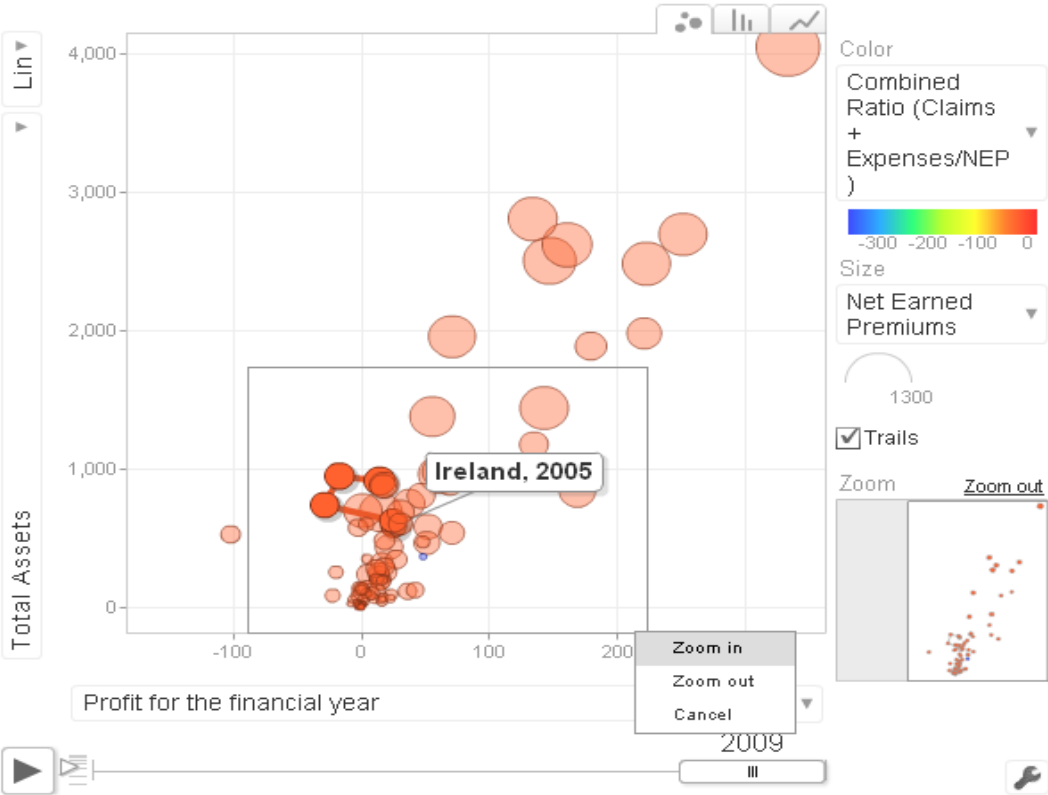
Dummy data for illustration purpose only.



# Case Study – Annual Account Analysis

~/ library / GoogleMotionChart / rsp / myAnalysis /

## Annual Accounts

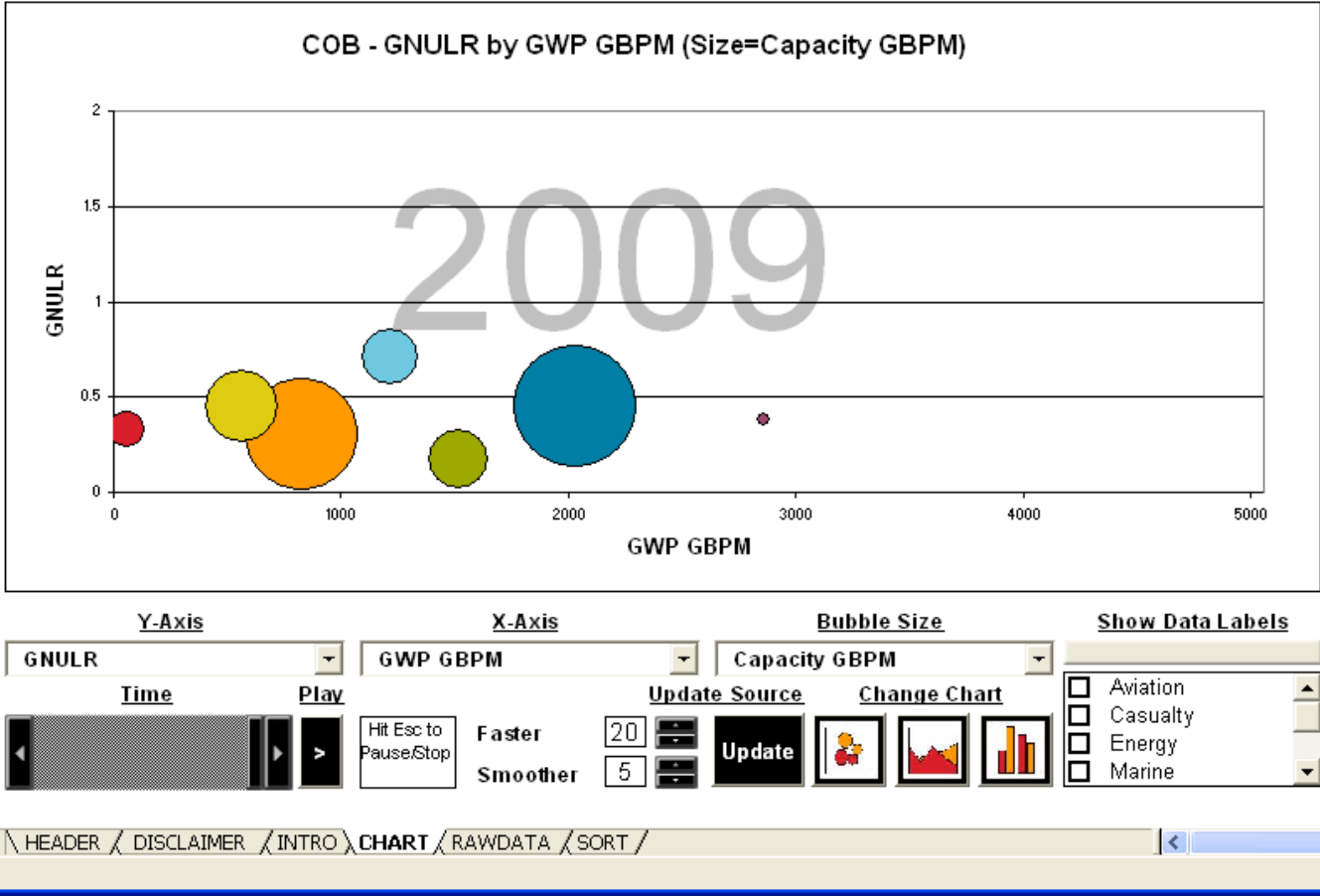


2010-09-30 14:03:17  
R version 2.10.1 (2009-12-14)

Generated on Thu Sep 30 14:03:22 2010.

Dummy data for illustration purpose only.

# Other Motion Chart Interfaces:



Will be available from [www.lloyds.com/stats](http://www.lloyds.com/stats) soon.

# Thanks.

- Any questions?